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CLARK COUNTY
WASHINGTON

LEWIS RIVER KNOTWEED CONTROL PILOT PROJECT
2005 REPORT

CLARK COUNTY WEED MANAGEMENT

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Clark County Weed Management, under the guidance of Phil Burgess, department director, requested and received funds for a knotweed pilot project to be conducted on the Lewis River and its tributaries. This report provides a basic review of the work accomplished during the 2005 treatment season, and gives recommendations and goals for the future. The attached spreadsheet provides the more detailed data for all infestations.

The start date for 2005 was May 1, beginning with an evaluation survey of the 2004 treated sites along the East Fork of the Lewis River. First application of the retreat sites along the river began on May 11. Initial retreatment portion of East Fork project was completed by June 20th.

Pilot Project Goal for 2005

After the completion of the survey and retreatment on the East Fork, the project targets were Cedar Creek and adjoining tributaries (Chelatchie Creek, Pup Creek, John's Creek, Brush Creek). The primary goal was to survey the main stem of Cedar Creek and its tributaries, treat each knotweed infestation at least once, hopefully twice (if needing a follow-up application).

Should the field team be successful in completing this task prior to seasons end then the next target area would be to move onto the North Fork of the Lewis River (Lake Merwin and Yale Lake inclusive). Treatment of both Clark County side and Cowlitz County side of the river would be accomplished by our team.

Injection treatment was deemed preferable from the start for the new 2005 sites not yet treated, particularly near water or around native vegetation. Foliar treatment was to be used only on canes too small for injection. This strategy was later modified, due to either the large number of canes contributing to site size, or the smaller diameters of the full sized canes that were common along river and creek banks.

Paid and Volunteer Labor

One project coordinator and three field laborers were paid for work performed in 2005. The field workers were employed for a four and a half month period. To ensure a licensed individual at each site when treatment was performed at two different locations, one of the field laborers received his applicator's license, with aquatics endorsement.

Pacific Power and Electric was instrumental in getting the North Fork part of the project started as they graciously provided a boat with jet outboard and operator, Marshall Adams. Mr. Adams helped for eight days to survey and treat areas of the river difficult to navigate. Survey and treatment of various islands was the focus of this part of the project, due to the difficulty of access into remote areas such as Eagle Island (113 acre site). A complete detailed survey was also performed by boat on Lake Merwin and Yale Lake.

Valuable assistance was given by Craig Lynch member of a local fly fishing group, who volunteered his drift boat, time and river experience to transport the team and equipment down river on various occasions.

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Description of Project Area

The East Fork Lewis River main stem totals 32.5 miles from Sunset Campground, at the border between Clark and Skamania counties, down to its confluence with the North Fork Lewis River. Approximately 72 miles of year-round tributaries exist in the East Fork watershed.

Cedar Creek is the main tributary of the North Fork Lewis. This 20 mile creek is fed by a series of smaller tributaries accounting for 60 miles of waterways. Of these tributaries, Pup Creek(5 miles), John's Creek(3 miles), Brush Creek(3 miles) and Chelatchie Creek(7 miles) were surveyed, and treated as needed. These tributaries accounted for 18 miles of the contributing waterways.

North Fork Lewis River main stem totals 21 miles from Ariel Dam to the Columbia River. The North Fork has a vast array of ecological communities to support. It is an important habitat for salmon and steelhead, supports a variety of wildlife such as bald eagles, osprey, beaver, blue heron, and various species of geese, duck and other water fowl. There are two Washington State fish hatcheries located on the river.

Ariel Dam creates Lake Merwin (25 shoreline miles). Above Lake Merwin is Yale Lake (19 shoreline miles). Two tributaries into the Yale Lake system were partially surveyed, Siouxon Creek (3 miles surveyed) and Canyon Creek (2 miles surveyed). Lake Merwin and Yale Lake are maintained by Pacific Power and Electric.

Survey

East Fork Lewis River:

Survey and Retreatment:

- Project start date: May 11, 2005
- All sites along the 32 miles of the East Fork were visited and accessed either by driving to the site or hiking into the site as needed.

- Sunset Falls.
- Sunset Falls Rd. and Lucia Falls Rd..
- Moulten Falls.
- Sites below Moulten Falls along Lucia Falls Rd. to Lucia Falls.
- Sites below Lucia Falls along Lucia Falls Rd. to Heisson Bridge.
- Cole Witter Rd. and surrounding sites.
- Lewisville Park
- Rinker area
- Daybreak Park
- Daybreak Maintenance Station
- Storedahl
- Swanson's
- Swanson's to La Center

❖ Project completed date: June 20, 2005

Cedar Creek:

❖ Project start date: June 20, 2005

- Starting at Amboy Bridge, up stream to head waters, access was done by driving to various points along the creek and hiking up stream or down stream as needed to complete surveys (9 miles).
- Starting at Amboy Bridge, down stream to above Grist Mill (8 miles) raft was used to access and treat sites.
- From Grist Mill to Mouth of Cedar Creek a combination of rafting and hiking into sites to survey and treat was used (3 miles).

Chelatchie Creek:

- Starting at Amboy to headwaters (Tum Tum Mountain) (7 miles), access was done by driving to various points along the creek and hiking up and down stream as needed to complete the survey.

Pup Creek (5miles), John's Creek (3 miles), Bush Creek (3 miles):

- Were all accessed by Cedar Creek Rd., and hiked up stream to complete survey and any treatment.

❖ Project completed date: August 18, 2005

Siouxon Creek (3 miles) and Canyon Creek (3 miles):

- Were surveyed by boat from Yale Lake and by driving to various locations along both creeks for partial survey. Access to these two creeks is very difficult at best, however from points of survey no infestations were seen.

North Fork Lewis River:

- ❖ Project start date: July 19, 2005
- The North Fork is a waterway different in characteristics from all the tributaries. Much of its length is wide and slow moving. Ariel dam regulates water flow. Dikes shape the banks around Woodland, and reed canary grass becomes dominant. Access was accomplished for the most part by Jet Boat or raft. There were limited sites available by land access.

- When using a raft, a vehicle would need to be positioned at entrance point and exit point to transport personnel and equipment. The crew would row to and from the site, using the rivers current to advantage. Needless to say, this is very time consuming, often leaving only four hours daily to actually treat at any sites found.

- Both Clark County and Cowlitz County sides of the river were surveyed and treated.

Eagle Island :

- 113 acre island is densely forested and covered with brush-like vegetation such as scotch broom, heavy concentrations of blackberry, reed canary grass and various small trees. Access by jet boat. Three day project to survey and treat.

Lake Merwin and Yale Lake:

- Both lakes were circum navigated by Jet Boat.
- Lake Merwin 25 miles surveyed, no infestations found.
- Yale Lake 19 miles surveyed, one infestation found at the mouth of Cougar Creek.
- ❖ Project completed date: September 28, 2005
- ❖ Final follow-up treatments applied September 28th through October 25th.

Survey Summary:

- 145 miles of river, creek, lake and tributaries were surveyed.
- Of this 40 miles total were treated for Japanese knotweed infestations.
- Totaling 500 acres and 307,000 canes treated.

The tributaries were approached differently. Whenever a tributary was encountered while surveying the main stem, that tributary was followed from its confluence to a point where it could be predicted there was a high probability of no knotweed occurring upstream. This prediction was based on remoteness of the location, lack of improved roads or home sites, or lack of knotweed found anywhere in the area.

- At a certain point, the likelihood of a knotweed patch existing in a remote tributary location must be weighed against the time and money expenditure needed to survey for that possible, but unlikely, knotweed patch. (See *Notes on Surveys*.)

After this, remaining sections of tributaries were surveyed from public vantage points (roads, bridges, county properties, trails), and on private properties when invited by the landowner. On many occasions, private landowners were willing to walk with us on their property so that we could survey, but were unwilling to sign the waiver of liability. These persons were invariably supportive of the control program.

Notes on Surveys

1. It can not be assumed that 100% of all knotweed infestations on the tributaries were found, even with this reasonable, systematic method. Surveying the entire length of all tributaries, including their seasonal drainages, requires much more time and complete landowner cooperation.

2. It also can not be assumed that 100% of all knotweed infestations were found within the 102 main stem survey miles and 43 tributary survey miles, due to the likelihood of human error. There is the possibility some small knotweed patches simply were not visually spotted.

<u>Knotweed Statistics</u>

- 291 infestations were recorded on 150 properties.
- 28 properties owned by Clark County, 6 State of Washington, 18 Pacific Power and Electric, and 98 Private Property owners.
- 262 of the 291 infestations are located on the waterways.

- Combining the knotweed infestations totals 500 acres:

Knotweed Treated Acres and Cane Numbers

	Location	Acres Treated	Number of Canes
	E Fork Lewis Retreat	78.24	38,523
	E Fork Lewis 1st Treatment	40.50	36,610
	N Fork Lewis (Clark County)	113.96	91,221
	N Fork Lewis (Cowlitz County	50.79	29,177
	Cedar Creek	104.95	51,498
	Chelatchie Creek	29.12	20,875
	Jenny Creek	8.25	5,185
	Pup Creek	11.13	2,520
	Speelyai Creek	3	2,940
	Upland - Clark County	41.35	15,029
	Upland – Cowlitz county	18.75	14,175
	TOTALS	**500**	**307,753**

- 187 of the 291 infestations are influenced by regular flooding:

Knotweed Infestations by Site Type

Site Type	# of Infestations
Riverbank	187
Occasional flooding	75
Upland	21
Roadside	8
Total	**291**

Data Gathering:

Information was hand-entered at each site onto a pre-printed form (see attached sample).
Data included needed information for WSDA Herbicide Application Form.

Examples of information recorded while in the field are:

- Date and times of treatment
- Acres of site
- Cane count
- Method of treatment
- Description of site (soil type, vegetation type)
- GPS number
- Wind speed and temperature
- Plant density
- Plant height

Treatment Methods

East Fork Lewis:

The 2005 project began with the re-treatment of the East Fork of the Lewis River. Return growth at sites treated in 2004, primarily by foliar spray, were often found to be stunted or mutated. When this occurred, foliar spray was the primary method of treatment. However there were still a number of sites with canes large enough to inject. There were 2,720 canes injected and 35,803 canes treated by foliar spray at the re-treatment sites. As treatment progressed along the East Fork there were a few sites discovered that were not treated in 2004. These sites were not found the year before, or were further away from the river. These new sites account for 7,885 injected canes and 28,725 foliar sprayed canes.

Jenny Creek:
Jenny Creek was part of the retreatment program. Methods of treatment used were the same as for the East Fork, accounting for 535 canes injected and 4,650 cane treated by foliar spray.

Cedar Creek and Tributaries:
As the project progressed into Cedar Creek and adjoining tributaries (Pup Creek, Chelatchie Creek), it was found that the canes were of smaller diameter, therefore foliar spray was used. An explanation as to cane diameter size may include the time in season that treatment was being performed, starting on June 6th. Also the Cedar Creek ravine is deep and shaded by surrounding tress and high stream banks therefore there is a sufficient difference in available light for growth. In other instances the sites were of a cane number size as to require by label a foliar treatment. Given this, there were 16,517 canes injected compared to 58,376 canes treated by foliar spray.

North Fork Lewis River:
Initial surveys of the sites within this river corridor revealed a similar growth pattern as found in Cedar Creek ravine, there being a significant difference in available light due to river bank height, sometimes extending several hundred feet above the river. Also, the top ridges and banks are heavily forested with tall native Cedar and various species of conifer trees, combined with other foliage. Most often, the south side of the river was covered in shade until late afternoon.

Yet another unique characteristic of this river system is "Eagle Island", 113 acres in size. The Island is set aside as a Wild Life Reserve, therefore no land management has taken place. It is very densely forested and has almost an unpenetratable ground cover of blackberries, scotch broom, vines, small trees and shrubs.

In addition, a significant number of sites were found to be so large in size, sometimes extending a quarter mile or more, that it was necessary to treat in accordance with herbicide labeling, which would require foliar spray as method of treatment. For example one site dubbed "The Big Kahuna" consisted of 41,750 canes. Another site named "Pita Point" consisted of 11,850 canes.

Given the nature of growth in the sites treated, there were 10,876 canes injected as compared to 109,522 canes treated by foliar spray within the treatment area of the North Fork.

Speelyai Creek:
There was only one site found to treat on this creek. A straight forward approach towards treatment was taken, inject what can be injected and spray the rest. 1,280 canes injected and 1,660 canes treated with foliar spray.

Upland Sites (Clark County and Cowlitz County):
Upland sites were primarily sites located away from program waterways. These sites, though not an immediate threat to the river systems, were treated to remove any further spread and any possible threat in the future to the near by waterways. Sites were mostly private property. Treatment was again straight forward, inject the mature canes and spray the small canes. 5,459 injected canes, 23,745 foliar sprayed canes.

Initially, injection was the intended method of application. This method accounts for 110 sites out of 291. The remaining sites were treated with foliar spray, reasons given below.

In the large, dense infestations away from water, a foliar combination of glyphosate (4 oz/gal) in the form of Aquamaster, imazapyr (1 oz/gal) in the form of Habitat, and surfactant (2 oz/gal) in the form of Agri Dex was used for the initial treatment.

1. The window for treatment in 2005 was closing. To insure the North Fork could be completed at least once from top to bottom, the foliar method was used on these large infestations away from water.

Initial Treatment of Infestations by Method:

Treatment Method	Number of Sites Treated	Number of Canes Treated
Injection only (Aqua-Master)	47	23,570
Foliar spray(Aqua/Habitat/Agri-Dex) only	181	148,050
Injection/ Foliar spray combination treat	63	136,133
Total	**291**	**307,753**

A good portion of the infestations also received a second treatment. Many of these follow-up treatments relied more heavily on the foliar method. This is particularly true at infestations where only smaller canes remained after the initial injection of the larger canes. When large canes remained (which were likely missed during the initial application), they were usually injected, not sprayed. A more detailed breakdown of follow-up treatments can be derived from the attached spreadsheets.

Recommendations to WSDA

Access and Waiver of Liability Issues

The 2005 project did not seem to have the problem of acceptance of the liability waiver by private property owners as was the case in 2004. I attribute this to the rewording of the agreement and also the education of the public by means of newspaper articles explaining the project objectives and progress. I was met by many with open attitudes towards treatment of knotweed in the river system that borders private property. I suggest a continued education of the public through releases in the major local newspapers.

GPS/Mapping:

Once again the GPS unit is an issue, as far as being appropriate for the needs of this program. This year's unit was rugged enough, however it was limited in the amount of information you were able to enter with each site. The unit would allow only seven letters after each ID number. This is hardly enough space to archive needed information linked with each GPS number. Also, there was no accompanying software for the down–loading of information from GPS to office computer. This piece of software would be a major contribution towards tracking project progress and identifying treated areas versus untreated areas.

Field Personnel:

As this project expands in size each year, encompassing several water systems, there is a need to increase the man power to match the expected goals of the project. Adding one more field person will give the team more ability to survey and treat sites in more than one location at a time. As more and more time is being required to survey and retreat the previous years sites it will leave less time for initial surveys and treatments.

Recommendations to Clark County

Transportation:

As the team is working in the "Wild" so to speak, I suggest that two four wheel drive vehicles with appropriate tires, rather than just the one, be assigned to this project.

Communication:

Due to the nature of the work environment, I feel strongly, in the interest of safety, that "radio communication" should be part of the field teams'

standard equipment. These units would need to be compact enough to put into your pocket, yet durable enough so as to withstand the rigors of outdoor use. There were a few occasions when the team was unintentionally separated and members became temporarily lost or unaccounted for. Communications between team members is essential should an emergency arise and fast action is required. Besides the "Walkie Talkies," I also suggest one additional telephone to broaden the communications between field teams and Project Coordinator.

Office Computer Support:

As the project requires accurate data entry and file keeping, I feel that a PC for this project is in order. The ability to down load GPS information into mapping software would greatly improve the efficiency of the record keeping for this project. Having an assigned PC would alleviate the need for a shared computer.

Clark County Weed Management Goals for 2006:

- Perform an evaluation survey of control work on the East Fork Lewis River, and treat all remaining infestations.
- Perform an evaluation survey of control work on Cedar Creek and tributaries, and treat all remaining infestations.
- Perform an evaluation survey of control work on the North Fork Lewis River, and treat all remaining infestations.
- Begin initial survey and treatment program on Abernathy Creek.
- Begin initial survey and treatment of the Washougal River and any tributaries.

Clark County Weed Management is thankful to WSDA for their support.